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MANUAL OF PONTON BRIDGE BUILDING, VOLUME II

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CONFIDENTIAL

MANUAL OF PONTON BRIDGE BUILDING, VOLUME II--

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Introduction:

The basis for the science of ponton bridge building is good personal instruction. Each engineer soldier and officer, non-commissioned or commissioned, must understand the methods and equipment used, so that they can work independently, swiftly, and expediently.

The training program at the regular training camp is filled with practice in handling vehicles and in building ponton bridges, under variable conditions. Particular emphasis is placed on training to travel on the water and to build ponton bridges at night.

The figures given in the manual for the strengths of the units and squads required to accomplish various tasks are the smallest possible but when the different duties are assigned, it is important to avoid breaking up the organizational units, subordinate units or squads.

The commands for carrying out the simplest, routine duties are described in the manual. As the training progresses the use of signals is introduced. Under conditions in the field, however, the rules laid down in the manual are to be used solely as a guide, with adaptations to fit the circumstances. Any method which helps to expedite the accomplishment of the mission is permissible.

During training maneuvers on the water, it is the responsibility of the instructor to see that the prescribed safety precautions are carried out. On this score, it is important that these safety pre-

cautions are carried out. On this score, it is important that these safety precautions, which are designed for training maneuvers in swift currents, should also be observed in practice exercises in slack currents in order that they may become thoroughly ingrained. (By swift current is meant anything over 1.5 meters per second. See Appendix 7.) Footnote from page 14.

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Chapter One--General Information

A. Description and Use of Ponton Bridge Equipage K/35.

1. With their equipment, a bridge company can build bridges, rafts, or landing stages. The approximate dimensions of the various bridges that can be built, including in each case a trestle on each shore, are given in the following table: (See also Appendix 1).

Carrying Capacity of Bridge, Tons	Number of Platoons	Approximate Length of Bridge, Meters	Remarks
4.5	1	60-68	
7	1	44-48	
12	1	36-40	
4.5	2	100-116	Two extra trestle spans
7	2	68-80	" " " "
12	2	52-68	" " " "
4.5	3	148-164	Four extra trestle spans
7	3	100-112	" " " "
12	3	76-84	" " " "

2. A ponton bridge consists of two sections, a fixed part and a floating part. The fixed section includes the abutment span, the supporting abutment sill and trestle, and the trestle span and its supporting trestle. The floating section consists of the float-

ing spans and the supporting pontons. The fixed section is connected to the floating section either with a "seka" span [See page 38 for def.] supported on the in-shore end by an abutment sill or a transom, and on the other end by a ponton,--or with a hinge span which is supported on the in-shore end by either an abutment sill or a trestle and on the other end by a floating span.

The bridge bed, which is attached to the supporting members, consists of the bunk (I-) beams, the transverse balks, the (longitudinal) balks, the chess, and the siderail equipage.

A trestle bridge is one having only trestles.

The floating section of a ponton bridge is generally built a span at a time, whereby the floating spans arrive at the bridge site already assembled; in exceptional cases the spans are assembled at the bridge head, being put together one balk-length of the span at a time. (See Sections 178-182).

When the floating spans are used for ferrying they are referred to as rafts.

That section of the bridge, starting at the abutment sill, which is anchored to the shore, is known as the shore-bridge.

The width of the roadway across the bridge is 290 centimeters, except on the hinge span, where it is 285 centimeters.

3. On ponton bridges of 4.5, 7, or 12 ton capacity, vehicles weighing these respective amounts may cross. On two-axle vehicles the heavier axle can not weigh more than 70 percent of the total weight of the vehicle, i.e. 3.2, 4.9, or 8.4 tons, respectively, for the 4.5, 7, or 12 ton bridges. The total allowable weight of single-axle vehicles is also 3.2, 4.9, and 8.4 tons, respectively, on the 4.5, 7, and 12 ton bridges.

In crossing a ponton bridge, vehicles whose individual weights correspond to the capacity of the bridge must follow each other at a distance not less than eight meters, or a distance equal to the length of one floating span. Vehicles whose individual weights are not more than one half of the capacity of the bridge, may cross the bridge spaced according to their usual line of march.

The maximum speed limit on ponton bridges is generally 12 kilometers per hour; on a 12-ton bridge, the speed limit for vehicles weighing from 7 to 12 tons is 8 kilometers per hour, except during unfavorable conditions, when it is 4 kilometers per hour. (See Section 4).

4. During unfavorable conditions such as strong winds, heavy waves, or a strong or indirect current, the freeboard, which in no case should be less than 25 centimeters, may not be sufficient for the particular capacity of the bridge. Under these circumstances, it becomes advisable to consider lowering the load limits, as for example, so that the following would apply:

	Load Limit, Tons
4.5 ton bridge or raft:	3
7 ton bridge or raft:	4.5
12 ton bridge or raft:	7

Alternatively, the speed limits may be lowered a corresponding amount.

The bridge officer will issue the necessary orders covering this situation and will see that they are carried out.

5. The abutment span and the trestle span are each six meters long and the "seka" span and the floating span are each eight meters

meters long. The floating span supporting the hinge span (whose balk length is 645 centimeters) on a 4.5 or 7 ton bridge can be moved 465 centimeters, and on a 12 ton bridge 385 centimeters. Under exceptional circumstances it is possible to make the abutment spans and floating spans four and six meters long.

6. The structure of the spans consists of the following:

a). In the standard 4.5 ton bridge, the various spans are comprised of the following equipage:

—Abutment span and trestle span: each have one transverse balk. (See Figure 91).

—The "seka" span: One ponton and two transverse balk. (See Figure 107).

—Floating span (deck section): two pontons, and one transverse balk. (See Figure 98).

—Floating span supporting a hinge span: three pontons and one transverse balk (Figures 121a and 121b); all these spans have simple side beams and simple chess.

Each span has eight balks.

b). In the standard 7 ton bridge, the various spans include the following equipage:

—Abutment span and trestle span: each have two transverse balk. (See Figure 92).

—The "seka" span: either two pontons and one transverse balk, (Figure 110) or,

one ponton and two transverse balk. (See Figure 111). (One ponton is generally used when the depth of water is less than 85 centimeters, which is too shallow for two pontons.) [Footnote from page 1e]

--Floating span (deck section): three pontons (Figure 100), or four pontons if the adjacent "seka" span has only one ponton. (Figure 111).

--Floating span supporting a hinge span: four pontons. (Figure 124).

Each span has simple side beams and simple chess. There are eight balk on each span.

c). In the standard 12 ton bridge, the spans are comprised of the following equipage:

--Abutment span and trestle span: four transverse balk. (two pairs). (Figure 93).

--The "seka" span: two pontons and four transverse balk (two pairs) (Figure 114) or,

one ponton and six transverse balk (in pairs) (Figure 115). (One ponton is generally used when the depth of water is less than 85 centimeters, which is too shallow for two pontons; however, when one ponton is used the freeboard at the joint where the "seka" span and the floating span come together is only 22-23 centimeters), [Footnote from page 19.] or,

three pontons and two transverse balk (Figure 116). (Three pontons are used when there is a shortage of transverse balk). [Footnote from page 19.]

--Floating span (deck section): four pontons (Figure 116), or five pontons, if the adjacent "seka" span has only one ponton. (Figure 115).

--Floating span supporting a hinge span: five pontons. (Figure 124).

Each of the spans has double side beams, double chess, and eight balk.

The special four-meter floating span has:

a). On the 4.5-7 ton bridges: two pontons (Figure 105).

b). On the 12 ton bridge: two pontons, double side-beams and double chess.

The special six-meter "seka" span has:

a). On the 4.5 ton bridge: One ponton and one transverse balk (Figure 109).

b). On the 7 ton bridge: two pontons and one transverse balk (Figure 112), or

one ponton and two transverse balk, in which case the adjacent floating span must have four pontons (Figure 113).

c). On the 12 ton bridge: two pontons, two transverse balk (as a pair), double side-beams and double chess (Figure 117), or

one ponton, four transverse balk (in pairs), in which case the adjacent floating span must have five pontons (Figure 118), and double side-beams and double chess. (When one ponton is used, the freeboard at the joint where the "seka" span and the floating span come together is only 22-23 centimeters). [Footnote from page 20.]

The special six-meter floating span has:

a). On the 4.5 ton bridge: two pontons.

b). On the 7 ton bridge: two pontons and one transverse balk (Figure 101), or

three pontons (Figure 104).

c). On the 12 ton bridge: three pontons, double side-beams and double chess.

The construction of the deck on all the bridges is the same. On the 4.5 ton bridge and the 7 ton bridge one hinge span can be adjusted a maximum of 465 centimeters and on the 12 ton bridge a maximum of 385 centimeters; when two hinge spans are used the bridge can generally be closed up.

The bridge can be lengthened or shortened at the central couplings of the spans about 20 centimeters per span for a maximum of 20 spans, but before this is done the bunk lashings must be loosened and after the adjustment of the bridge length they must be made fast again.

On a bridge that has no trestles, it is also possible to lengthen the bridge or to close the gap by moving the abutment sill on either or both shores, either further inland or closer to the shore.

B. Composition of A Bridge Company.

7. A bridge company is a transportation and maintenance organization. It consists of:

--The commanding officer and the Second-in-Command,

--The company headquarters,

--three ponton bridge platoons,

--an assault boat platoon, and

--a services platoon.

The company headquarters includes the following personnel and equipment:

--A squad leader,

--a motor vehicle (for the company commander), and

--two motorcycle messengers (two motorcycles with sidecars).

Each of the three ponton bridge platoons includes:

--a platoon leader,

--a second-in-command,

--a medical corpsman,

--a messenger, and

--a motor vehicle (for the platoon leader).

The bridge builders' shore squad includes:

--the squad leader,

--the abutment span vehicles (2 trucks),

--the "seka" span vehicles (2 trucks),

--the hinge span vehicle, (one truck), and

--the accessory equipment vehicle (one truck).

The three ponton bridge squads include:

--the squad leaders, and

--the vehicles for the pontons (12 trucks).

The engineers squad includes:

--the squad leader, and

--the engineer troops.

The assault boat platoon includes:

--a platoon leader,

--a second-in-command,

--a medical corpsman,

--a messenger,

--a motor vehicle (for the platoon leader),

--a troop transport vehicle (an 18 passenger bus), and

--a vehicle for fuel (one truck).

The three assault boat squads include:

--the squad leaders,

--the assault boat crews, and

--the vehicles for the assault boats (6 trucks).